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Release B (EOS-AM1/Landsat-7) SDPS/CSMS CDR Review Guide for the ECS Project

Technical Paper

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RESPONSIBLE ENGINEER

Arthur Palmer /s/ 3/28/96

Arthur M. Palmer, Lead System Engineer Date
EOSDIS Core System Project

SUBMITTED BY

Rick Kochhar /s/ 3/28/96

Rick K. Kochhar, Release B CCB Chairman Date
EOSDIS Core System Project

Hughes Information Technology Systems
Upper Marlboro, Maryland

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Abstract

This Review Guide for the Release-B (EOS AM-1/Landsat-7) SDPS/CSMS Critical Design Review (CDR) is provided to assist in reviewing the CDR documentation set and to prepare for participation in the upcoming CDR. The Release-B CDR milestone is similar to Interim Design Review (IDR) for the earlier Release. The guide presents a list of the documents prepared as part of the CDR, a list of other supporting documents, and a road map through the documentation set for different groups of readers. Some methodological notes are included, as well as an update on the organization of ECS development activity. It also includes the objectives of the CDR at a high level, the scope of Release-B, and a draft agenda for the briefings to be presented April 15 - April 25, 1995.

Keywords: CSMS, SDPS, CDR, Release-B, Landsat-7, AM-1

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1. Introduction

1.1 Purpose

This technical paper is provided to assist in reviewing the Release B (EOS-AM 1/Landsat 7) SDPS/CSMS Critical Design Review (CDR) document set and to prepare for participation in the upcoming Release B CDR sessions. Participation in this review is important and appreciated.

This document is not a deliverable item under the EOSDIS Core System (ECS) contract. It is provided solely as a convenience for the reviewers. Accordingly, this technical paper itself is not subject to comment.

This guide contains material addressing the following topics:

- ECS development organizations and the Release B CDR
- CDR Objectives
- Scope of Release B
- Summary of organizations participating in CDR
- CDR deliverable documents
- Other relevant documents
- Documentation road map
- Draft agenda for the CDR briefings April 15 - April 24, 1996

1.2 ECS Development Organizations

In an effort to maximize the communication and coordination between the Communications and Systems Management Segment (CSMS) and the Science and Data Processing Segment (SDPS), ECS reorganized those development organizations after their respective Preliminary Design Reviews into a single organization, the Science and Communications Development Office (SCDO). This organization was organized by system release; Interim Release 1 (TRMM Infrastructure Release), Release A (TRMM Release) and Release B (EOS-AM1/Landsat-7 Release). Accordingly, as at the IDR held in November, the upcoming Release B CDR covers both segments. Design and development for the Flight Operations Segment (FOS) remains as a distinct organization, while still exploiting the infrastructure services provided by the CSMS components. FOS held a combined Release A/B CDR in October, 1995. FOS-unique CSMS activity (e.g., the EOC LAN design) was documented and presented as part of the FOS CDR.

1.3 CDR Objectives

The objectives of the Release B CDR are to demonstrate that the CSMS and SDPS designs satisfy Release B allocated requirements, to present prototyping results, and to evaluate the technical risks associated with development of the segments and their elements. This is accomplished by:

- Reviewing requirements changes since IDR
- Demonstrating that the detailed design under review satisfies the performance and functional requirements of the development specification
- Establishing the detailed design compatibility among the release components and other ECS components, facilities, software, and personnel
- Evaluating the progress, technical adequacy, and risk resolution (on a technical, cost, and schedule basis) of the selected design approaches
- Determining the segments' compatibility with ECS performance requirements
- Evaluating the results of modeling and simulation studies
- Demonstrating how prototyping results are being applied to the design and presenting plans for any further prototyping evaluations that are needed
- Assessing growth potential of the design elements included in the review
- Evaluating the progress, consistency, and technical adequacy of the selected software design and test approach, comparing the current estimate of lines of code with the estimate at the IDR, and assessing the compatibility between software requirements and detailed design
- Evaluating the adequacy of any hardware purchase plans, including the hardware product specifications.

The accomplishment of many of the these tasks must be assessed from the CDR documentation, coupled with the detailed reviews. The CDR sessions will be conducted over the course of nine days. The first six days will be devoted to detailed design reviews of the subsystems. The following three days will consist of design summaries and findings developed by the reviewers; overviews; and management presentations.

ECS subsystems are developed on one of two development tracks. During week one the CDR presents the detailed design of the subsystems that are being developed on the formal track, listed below:

Ingest

Planning

Data Processing

Data Server

Management Services

Communications Services

CDR also presents the remaining subsystems (Client/Interoperability/Data Management) as an incremental development status briefing. An architectural overview of both formal track and incremental track subsystems, across both segments, is provided in the design specification documentation, and will be briefed at the CDR presentation.

1.4 Scope of Release B

The Earth Observing System (EOS) Data and Information System (EOSDIS) Core System (ECS) capabilities are developed as four formal releases. Release B, the second formal ECS release, builds on Release A and provides capabilities designed to support AM-1, Landsat-7, and RADAR ALT missions, as well as provide for the SeaWinds and COLOR instruments.

Release B expands the capabilities of Release A by providing full functionality and services required for AM-1 launch and data operations, for supporting Landsat-7 operations, and for providing on-going operational support for TRMM. Release B also provides capabilities to support the COLOR, ADEOS II, RADAR ALT, ACRIM, and METEOR missions. Release B also provides the means by which ECS users may gain access to and receive Synthetic Aperture Radar (SAR) products from the ERS-1, ERS-2, JERS-1, and the RADAR SAT missions, which are processed and archived at the Alaska SAR Facility. As part of Release B, the Data Assimilation Office becomes part of the ECS at the GSFC ECS DAAC.

Release B is deployed at seven physical sites - the original Release A sites (SMC and ECS DAAC at GSFC; ECS DAACs LaRC and EDC), plus four newly commissioned ECS DAAC sites - the National Snow and Ice Data Center (NSIDC), the Jet Propulsion Laboratory (JPL), the Oak Ridge National Laboratory (ORNL), and the Alaska SAR Facility (ASF).

Release A and B software is also delivered but not acceptance tested at an eighth ECS DAAC site, the Socio-Economic Data and Applications Center (SEDAC), at the Consortium for International Earth Science Information Network (CIESIN) in Saginaw, Michigan. Table 1-1, ECS Release B DAAC and SMC Support Enhancements, provides a summary of the DAAC and SMC support provided in Release B versus that provided in Release A. Release B also includes the EOS Operations Center (EOC); the EOC was separately reviewed at a PDR in December 1994 and a CDR in October 1995.

Release B communications interfaces include the National Aeronautics and Space Administration (NASA) Science Internet (NSI), the NASA Communications (NASCOM) Operational Local Area Network (NOLAN), and the EOSDIS Backbone Network (EBnet). These interfaces are physically located at the SMC and at the ECS GSFC, LaRC, EDC, NSIDC, JPL, ORNL, ASF, and SEDAC DAAC sites. The communications networks connect ECS to data providers at the Sensor Data Processing Facility (SDPF), the ECS Data and Operation System (EDOS), the Landsat Processing System (LPS), the NOAA ADC, the TRMM Science Data and Information System (TSDIS), the EOSDIS Version 0 system, the processing facility at the ASF, and the sources of Level-0 data for COLOR, ADEOS II, RADAR ALT, ACRIMSAT and the METEOR missions. The primary data users for Release B are the science user community who access the eight ECS DAACs (including SEDAC), the SCFs, Landsat IAS, and the ASTER GDS.

Table 1-1. ECS Release B DAAC and SMC Support Enhancements

Site	Release A Capabilities	New Release B Capabilities Deployed at Each Site
SMC	System Performance Monitoring & Analysis; WAN Management; and System Coordination Support.	SMC Services Extended to ASF, JPL, NSIDC, ORNL & SEDAC; and Interoperability with ASTER GDS.
GSFC DAAC	TRMM Mission Support; VIRS Data Ingest, Archive & Distribution; Ingest Ancillary Data; AM-1 Interface Testing; AM-1 MODIS Science Software I&T; V0 Data Migration & Interoperability; TOMS Ozone Data Ingest and Archive; LIS Level-0 Data Ingest; SSM/i; GPCC & GPCP Ingest & Archive; PR, TMI & GV Data Ingest; LIS Science Software I&T; and System Resource Management.	AM-1 Mission Support; MODIS Level-0 Data Ingest; MODIS Levels 1A, 1B, 2, 3 & 4 Production and Distribution; MODIS Levels 1A, 1B, 2 & 3 Archive; COLOR Science Software I&T; COLOR Level-0 Ingest; COLOR Level 1-3 Production, Archive & Distribution; Interoperability with ASTER GDS; Interoperability with New DAACs; and DAS Level 4 Production, Archive and Distribution
LaRC DAAC	TRMM Mission Support; TRMM CERES Data Ingest, Production, Archive & Distribution; V0 Data Migration & Interoperability; AM-1 Interface Testing; RMM & AM-1 CERES, and MISR & MOPITT Science Software I&T; SAGE Aerosol & Ozone Data, and ISCCP Data Ingest and Archive; System Resources Management; and NOAA Ancillary Data Ingest.	AM-1 Mission Support; AM-1 CERES, MISR & MOPITT Level-0 Data Ingest; AM-1 CERES, MISR & MOPITT Level 1-3 Production, Archive and Distribution; METEOR SAGE III Science Software I&T; SAGE III Level-0 Ingest; SAGE III Level 1-2 Production, Archive & Distribution; ACRIM Science Software I&T; ACRIM Level-0 Ingest; ACRIM Level 1A Production, Archive & Distribution; Interoperability with ASTER GDS; and Interoperability with New DAACs.
EDC DAAC	Landsat-7 Interface Testing: Landsat-7 Level-0R Data Ingest; ASTER/MODIS Science Software I&T; Ancillary Data Ingest; and System Resource Management.	AM-1 Mission Support; Landsat-7 Mission Support; ASTER Level 1A &1B Data Ingest; ASTER Level 2 Production, Archive & Distribution; MODIS Level 2-4 Ingest; MODIS Levels 3 & 4 Production, Archive & Distribution; Landsat-7 Data Archive; Landsat-7 Data Access & Ordering Support; Inter-Operability with ASTER GDS; Interoperability with New DAACs; and V0 Data Migration & Interoperability; and System Resource Management.
ASF DAAC	Not Deployed.	Interface to the Alaska SAR Component for the Access & Distribution of Level 0 ERS-1, JERS-1, ERS-2, and RADARSAT Data; Interface to ASF Production Systems for Generation of SAR Higher-Level Products; Archive of Selected ERS-1, JERS-1, ERS-2, and RADARSAT Level 1&2 Data; Inter-Operability with ASTER GDS; Interoperability with Other DAACs; V0 Data Migration & Interoperability; and System Resource Management. Interoperability with CSA.
JPL DAAC	Not Deployed.	ADEOS II SeaWinds Science Software I&T; SeaWinds Level-0 Data Ingest; SeaWinds Level 1B & 2 Production, Archive & Distributin; Non-Redundant AMSR Level-2 Ingest; RADAR ALT DFA Science Software I&T; DFA Level-0 Ingest; DFA Level 1-4 Production Archive & Distribution; RADAR ALT MR Science Software I&T, MR Level 1B Production Archive & Distribution; Inter-Operability with ASTER GDS; Interoperability with Other DAACs; V0 Data Migration & Interoperability; and System Resource Management.
NSIDC DAAC	Not Deployed.	AM-1 Mission Support; MODIS Level 2 Data Ingest; Archive and Distribution; MODIS Level 3 Production, Archive & Distribution; Inter-Operability with ASTER GDS; Interoperability with Other DAACs; V0 Data Migration & Interoperability; and System Resource Management.
ORNL DAAC	Not Deployed.	Inter-Operability with ASTER GDS; Interoperability with Other DAACs; V0 Data Interoperability; and Limited System Resource Management. Interface to ORNL archiving components for Distribution of ORNL Products. (ECS provides a subset of DAAC hardware - ORNL provides and integrates the rest)
SEDAC	Not Deployed.	Interoperability with Other DAACs (ECS provides software only - SEDAC integrates)
EOC	Not Deployed	AM-1 Operations (Planning and Scheduling, Command and Control of AM-1 platform and instruments)

1.5 Participating Organizations

ECS has a large number of stakeholders who will be represented at the Release B CDR, including:

- EOS Advisory Panel
- DAAC managers, scientists, engineers, user working groups
- ECS tirekickers
- Instrument Teams
- SDPS Design Working Group, Data Model Working Group, Ad Hoc Working Groups on Production and Consumers
- ESDIS (SISDO, DSNO, FOS, Systems Engineering, the Project Office)
- NASA headquarters
- TRMM, AM-1, Landsat 7
- EDOS, EBnet
- NOAA
- International Partners
- Other ECS organizations (M&O, FOS, Quality Office, Systems Management Office, IATO)
- IV&V contractor

1.6 Additional Information

All documents identified in this technical paper are available in electronic form via the ECS Data Handling System (URL = http://edhs1.gsfc.nasa.gov). The EDHS also provides electronic versions of such useful background material as the ECS Functional and Performance Requirements Specification ("Level 3s"), the ECS IRDs and ICDs, and the overall ECS System Design Specification (as issued for the 6/94 System Design Review). If there are problems accessing these documents please contact the EDHS Administrator (edhsadmin@eos.hitc.com).

Questions concerning distribution or control of this document should be addressed to:

Data Management Office
The ECS Project Office
Hughes Information Technology Systems
1616 McCormick Drive
Upper Marlboro, MD 20774

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2. CDR Documentation

2.1 Introduction

A large array of technical documentation has been provided to EOSDIS and its partners to allow a careful review of the ECS Release B SDPS/CSMS detailed design. To maximize the effectiveness of the Critical Design Review, reviewers are encouraged to examine the materials pertinent to their efforts and disciplines, and be prepared to ask questions either as an active participant at the CDR, or through the Review Item Discrepancy (RID) process.

In order to understand the relationships between the many documents developed for CDR, two graphical devices have been developed. Appendix A, Release B Document Tree, illustrates the hierarchical relationship between: 1) the System documents versus the release specific documents, and 2) the requirements and operations concepts documents and the various volumes of the segment design specification. The other graphical depiction of document relationships is shown in Figure 2-1, Systems Engineering Verification. Figure 2-1 shows the relationships between the Requirements Specifications, the Operations Concept Document (OCD) and the Design Documents.

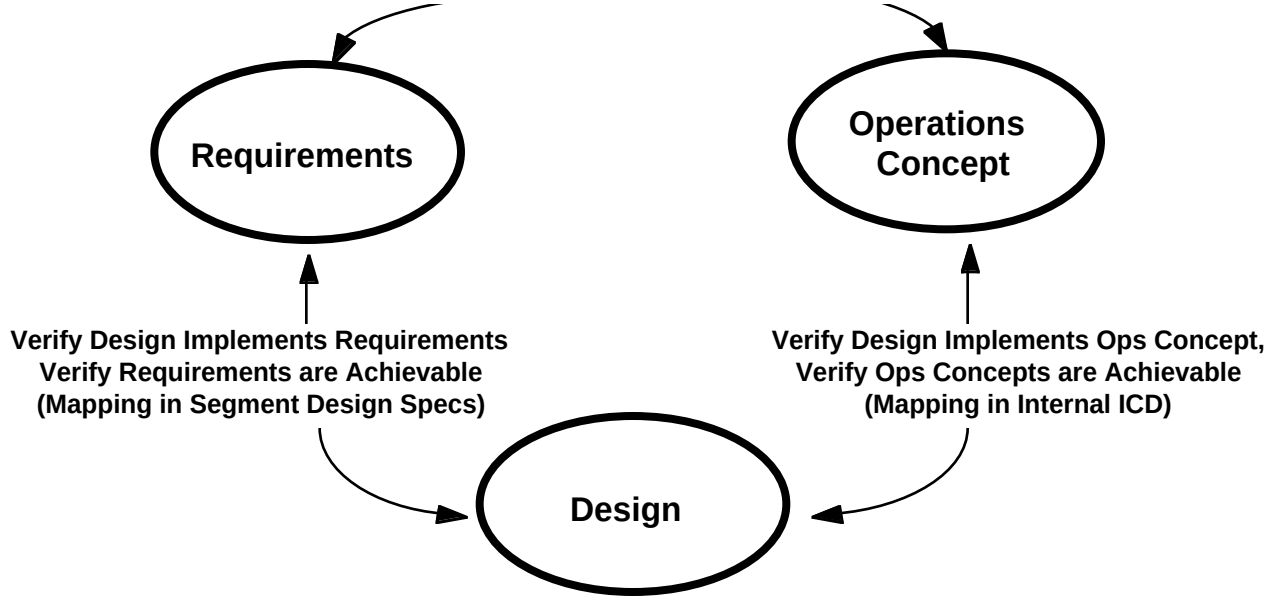

Figure 2-1. Systems Engineering Verification

These relationships provide a mechanism for verification of each systems engineering product. The relationships are summarized below:

- Interpretation of the Level 3 Requirements is provided through a set of core scenarios in the Release B Operations Concept Document. The necessity for the services illuminated in the scenarios is verified by a mapping of Scenarios to Level 3 requirements in Appendix B of the OCD.
- The completeness and necessity of the segment designs are verified by a two way mapping between the Level 4 requirements and design components in the Subsystem Design specifications.
- The relationship between the operations concepts and the design is verified by the commonality of scenarios in the OCD (604-CD-002-001) and the design scenarios in the SDPS/CSMS Internal Interface Control Document (313-CD-006-002).

2.2 Review Documentation

ECS personnel have provided six major categories of technical information for review which thoroughly describe the preliminary design the SDPS/CSMS Release B. These categories include:

2.2.1 Segment Requirements Specification

Segment requirements for CSMS and SDPS are specified in a combined SDPS/CSMS Requirements specification. In addition to the Level 4 Requirements, this document provides information on interfaces, performance and data type services.

304-CD-005-002	Release B SDPS/CSMS Requirements Specification for the ECS Project

2.2.2 Operations Concept Document

An Operations Workshop was conducted in Upper Marlboro during January, 1996, supported by representatives from ESDIS and the DAACs. Comments, questions and clarifications obtained during the workshop were incorporated into the Release B. The Operations Scenarios document was updated in parallel, supported by reviews and feedback from the Operations Working Group.

604-CD-002-003	Operations Concept for the ECS Project: Part 2B - ECS Release B
605-CD-002-001	Release B SDPS/CSMS Operations Scenarios for the ECS Project

2.2.3 Software and Hardware Design Documents

The primary design volume, DID 305, has been partitioned into 20 sub-volumes, falling into four categories: overview, subsystem design, facility-unique hardware designs, and (object) data dictionary. Also included in this group of documents is DID 313, which collects all of the public internal interfaces in the SDPS/CSMS Release B system; these include inter-subsystem interfaces, and inter-configuration item interfaces. In addition, this document contains a mapping

of all external interfaces (see External Interfaces section) to the corresponding public internal interface object.

305-CD-020-002	Release B SDPS/CSMS Design Overview Specification for the ECS Project
305-CD-021-002	Release B SDPS Client Subsystem Design Specification (CLS) for the ECS Project
305-CD-022-002	Release B SDPS Interoperability Subsystem Design Specification (IOS) for the ECS Project
305-CD-023-002	Release B SDPS Data Management Subsystem Design Specification (DMS) for the ECS Project
305-CD-024-002	Release B SDPS Data Server Subsystem Design Specification (DSS) for the ECS Project
305-CD-025-002	Release B SDPS Ingest Subsystem Design Specification (INS) for the ECS Project
305-CD-026-002	Release B SDPS Planning Subsystem Design Specification (PLS) for the ECS Project
305-CD-027-002	Release B SDPS Data Processing Subsystem Design Specification for (DPS) for the ECS Project
305-CD-028-002	Release B CSMS Communications Subsystem Design Specification (CSS) for the ECS Project
305-CD-029-002	Release B CSMS System Management Subsystem Design Specification (MSS) for the ECS Project
305-CD-030-002	Release B GSFC DAAC Design Specification for the ECS Project
305-CD-031-002	Release B LaRC DAAC Design Specification for the ECS Project
305-CD-033-002	Release B EDC DAAC Design Specification for the ECS Project
305-CD-034-002	Release B ASF DAAC Design Specification for the ECS Project
305-CD-035-002	Release B NSIDC DAAC Design Specification for the ECS Project
305-CD-036-002	Release B JPL DAAC Design Specification for the ECS Project
305-CD-037-002	Release B ORNL DAAC Design Specification for the ECS Project
305-CD-038-002	Release B System Monitoring and Coordination Center (SMC) Design Specification for the ECS Project
305-CD-039-002	Release B Data Dictionary for the ECS Project Subsystem Design Specification

313-CD-006-002 Release B SDPS/CSMS Internal Interface Control Document for the ECS Project

420-TP-010-002 Transition to Release B for the ECS Project

2.2.4 Database Design

The data base designs for CSMS and SDPS are specified in a combined SDPS/CSMS data base and schema document (to be delivered at CDR + 30 days):

311-CD-002-005 Science Data Processing Segment (SDPS) Database Design and Database Schema Specifications for the ECS Project

311-CD-003-005 Communications and System Management Segment (CSMS) Database Design and Database Schema Specifications for the ECS Project

2.2.5 External Interfaces

Ten External Interface Control Documents (ICDs) are applicable to the Release B CDR. A number of these were developed specifically for Release B IDR and updated for CDR.

209-CD-001-002 Interface Control Document Between EOSDIS Core System (ECS) and the NASA Science Internet (NSI)

209-CD-002-003 Interface Control Document Between EOSDIS Core System (ECS) and the ASTER Ground Data System

209-CD-005-005 Interface Control Document Between EOSDIS Core System (ECS) and Science Computing Facilities (SCF)

209-CD-006-005 Interface Control Document Between EOSDIS Core System (ECS) and Affiliated Data Center (ADC)

209-CD-011-004 Interface Control Document Between the EOSDIS Core System (ECS) and the Version 0 System for the ECS Project

209-CD-013-003 Interface Control Document Between EOSDIS Core System (ECS) and Landsat-7 for the ECS Project

209-CD-021-002 Interface Control Document Between EOSDIS Core System (ECS) and Alaska SAR Facility (ASF) DAAC

209-CD-022-002 Interface Control Document Between EOSDIS Core System (ECS) and Oak Ridge National Laboratory (ORNL) DAAC

209-CD-027-001 Interface Control Document Between EOSDIS Core System (ECS) and Stratospheric Aerosol and Gas Experiment (SAGE)

819-RD-001-001 Interface Control Document Between EOSDIS Core System (ECS) Application Program Interface (API) Interface Description Document (IDD)

2.2.6 Other Contractual Documents

This section contains other contractual documents relevant to CDR that do not fit into the categories above.

404-CD-001-003	Procedure for Control of Unscheduled Activities During Verification for the ECS Project
511-CD-002-001	Release B Maintainability Demonstration Plan for the ECS Project
515-CD-002-002	Release B Availability Models/Predictions for the ECS Project
516-CD-002-002	Release B Reliability Predictions for the ECS Project
518-CD-002-002	Release B Maintainability Predictions for the ECS Project
532-CD-002-001	Release B Environmental Control Plan for the ECS Project
607-CD-001-002	ECS Maintenance & Operations Positions Descriptions for the ECS Project
616-CD-002-001	Release B Integrated Support Plan for the ECS Project

2.2.7 Other Contractual Documents Due After CDR

This section contains other contractual documents which are due thirty (30) days after CDR

302-CD-003-001	Release B Facilities Plan for the ECS Project
613-CD-003-001	Release B COTS Maintenance Plan for the ECS Project
614-CD-001-003	Developed Software Maintenance Plan for the ECS Project
618-CD-002-001	Release B Replacement Part List and Spare Parts List for the ECS Project
619-CD-002-001	Test and Support Equipment Requirements List for the ECS Project

2.3 Other Documentation

These documents have been previously released but may be useful to the CDR reviewers.

175-WP-001-001	HDF-EOS Primer for Version 1 EOSDIS for the ECS Project
152-TP-001-002	Acronyms for the ECS Project for the ECS Project
210-TP-001-006	Technical Baseline for the ECS Project
221-TP-001-002	Process vs. Store Technical Paper for the ECS Project
222-TP-003-008	Release Plan Content Description for the ECS Project
420-TP-002-001	The ECS Ingest Subsystem Design Analysis for the ECS Project

420-TP-008-001	ECS Common Desktop Environment Migration Study for the ECS Project
440-TP-003-001	Science Software Data Server Access: A Trade-off Study Analysis for the ECS Project
440-TP-004-001	Guaranteed Level of Service for the ECS Project
440-TP-005-001	Physical Access and Media Management for the ECS Project
440-TP-006-002	Production Topologies: A Trade-off Study Analysis
440-TP-007-001	Production Platform Families for the ECS Project
440-TP-008-001	Distributed and Parallel Processing for ECS Science Algorithms: A trade-off Study Analysis
440-TP-009-001	Network Attached Storage Concepts & Industry Survey for the ECS Project
440-TP-010-001	DADS MR-AFS Proof of Concept Results for the ECS Project
440-TP-011-001	Manual vs. Automated Data Ingest Analysis
440-TP-014-001	ECS Ingest Subsystem Topology Analysis
440-TP-015-001	PDPS Scheduling COTS for Planning and Data Processing Trade Study
441-TP-002-001	Hypertext Document Reading Tool Trade Study: Summary of Evaluation Results
543-TP-001-003	A Cost Comparison of Transferring Inter-DAAC Data via Media versus the ESN WAN
410-TD-001-002	ECS User Interface Style Guide
410-TD-003-001	ECS Object Modeling Technique Tutorial

2.4 Documentation Road map

As is clear from the preceding sections, The ECS Release B Team has prepared a large amount of documentation for the SDPS/CSMS Release B CDR. One document is singled out as a design overview document, DID 305-CD-020-002, *Release B SDPS/CSMS Design Specification Overview for the ECS Project.* This document provides an architectural view of the system at the subsystem and configuration item level, a reference (non-DAAC specific) hardware description, and a chapter on design topics which span all or many subsystems (e.g., distributed communications architecture, security architecture, external interface architecture, systems management architecture, and user interface architecture. It is recommended reading for all audiences.

The following table indicates the likely level of review interest associated with the SDPS/CSMS CDR document deliveries against the following readership groups:

OPERations—DAAC Managers, M&O, User Services, TRMM ground system, EDOS, flight team

USER—EOSDIS science users

NET-HW—EOSDIS networks ("NT," EBnet, NSI, PSCN, V0, etc.) and hardware

DEVelopers—SDPS, FOS, CSMS

SE—system engineering interests (SMO, IATO, IV&V, ...)

MGR—various management interests in ESDIS and ECS

DP—Data Providers (SCFs, PIs, ECS external providers,...)

Table 2-1. CDR Documentation Roadmap (1 of 2)

DID Number	Short Title	OPER	USER	NET-HW	DEV	SE	MGR	DP
209-CD-0xx-00x	ICDs Between ECS and external entities (See Section 2.2.5)	X		X	X	X		X
304-CD-005-002	System Requirements Specification	X	X	X	X	X	X	X
305-CD-020-002	SDPS/CSMS Design Specification Overview	X	X	X	X	X	X	X
305-CD-021-002 through 305-CD-029-002	Subsystem Design Specifications (See Section 2.2.3)				X	X		X
305-CD-030-002 through 305-CD-038-002	Site Design Specifications (See Section 2.2.3)	X		X	X	X		X
305-CD-039-002	Data Dictionary for the ECS Project Subsystem Design Specification				X	X		

Table 2-1. CDR Documentation Roadmap (2 of 2)

DID Number	Short Title	OPER	USER	NET-HW	DEV	SE	MGR	DP
313-CD-006-002	SDPS/CSMS Internal Interface Control Document				X	X		
404-CD-001-003	Procedure for Control of Unscheduled Activities During Verification	X				X		
420-TP-010-002	Transition to Release B	X		X	X	X	X	X
511-CD-002-001	Release B Maintainability Demonstration Plan					X		
515-CD -002-002	Availability Models/Predictions for the ECS Project	X				X		
516-CD -002-002	Reliability Predictions	X				X	X	
518-CD -002-002	Maintainability Predictions	X				X	X	
532-CD-002-001	Environmental Control Plan	X				X		
604-CD-002-003	Operations Concept: Part 2B - Release B	X			X	X	X	X
605-CD-002-001	Release B SDPS/CSMS Operations Scenarios	X	X		X	X		X
614-CD-001-003	Developed Software Maintenance Plan	X					X	
616-CD-002-001	Release B Integrated Logistics Support Plan	X				X		

3. Critical Design Review

3.1 Introduction

The Critical Design Review is a series of planned events designed to familiarize the participants with the design and progress of the ECS development and evolution. The ECS team will host meetings, presentations, demonstrations, and exhibits designed to encourage discussion and information interchange.

3.2 Week One

Week one of the CDR will focus on detailed reviews of each of the subsystems. Each day will be divided into two parallel tracks, with each track focusing on a specific subsystem. Six person teams of reviewers from selected by ESDIS will adjourn to break-out rooms where they will conduct detailed reviews of their selected subsystems. The review teams will be complimented by an equal number of ECS team members. The duration of each review session will range from one-half to one-and-one-half days, depending on the size and complexity of each subsystem, and whether development is on the incremental or formal track. This technique encourages a focused interchange of questions, answers, and ideas.

It is important the team members review the appropriate Subsystem Design Specification (305-CD-02X-002) and relevant sections of the Internal Interface Control Document (313-CD-006-002) prior to the detailed design review.

3.3 Week Two

Week two will be held in the auditorium and devoted to panel reviews, system overviews, and management topics. The review teams will have prepared summaries and assessments of their respective design sessions, which they will present to the general audience. Additionally, demonstrations and poster sessions will be held during the lunch period.

3.4 Data Server Subsystem

Two of the four components that make up the Data Server Subsystem (DSS) are behind schedule, and will not be sufficiently mature for a CDR in April. Since DSS is the "heart of the system", it is important to examine the impact in detail.

DSS consists of four Computer Software Configuration Items or CSCIs. The four DSS CSCIs and their associated functions are:

> Science Data Server (SDSRV): Performs searches; manages request queues (e.g., for inserts, searches, and data acquisitions or orders); includes Earth Science Data Types (ESDTs), the object instantiation of each of the products and its associated services.

Storage Management (STMGT): Manages all storage resources - the archive itself, including disk, tape robots, etc.

Data Distribution (DDIST): Manages the network and hard media distribution of data products acquired by end-users and data processing.

Document Data Server (DDSRV) - Performs search and retrieval of documentation related to ECS products and services.

All DSS interfaces are complete and stable. This includes inter-CSCI interfaces among the DSS components as well as interfaces to other ECS Subsystems and those used by end-users to access DSS services. However, the internal design of SDSRV and DDSRV will not be ready by April. The project and ECS are therefore planning to proceed with CDR as scheduled, and hold a "Delta Detailed Design Review" (Delta DDR) for the internals of the two affected CSCIs on 6 June 1996.

At CDR, ECS must demonstrate the stability of the interfaces of these two components in order for all other development to proceed, as well as a recovery plan to make up for the schedule slip so that no system-critical functions are impacted. ECS presented the first draft of this recovery plan and it is complete and credible. In particular, the IDR version of the development plan showed all of SDSRV as one block of code. SDSRV, in fact, can be broken down into several parallel pieces in order to recover all of the schedule loss.

SDSRV is obviously mission-critical. However, most of the interfaces are inherited directly from Release A. The major additional code, which is fully encapsulated within SDSRV includes:

the development of a number of new ESDTs

the development of wrapper classes for the Illustra DBMS to replace the Release A wrappers to Sybase

security and price look-up code to handle sensitive and/or billable products and services

DDSRV is a relatively small and straightforward component, delayed by the reallocation of resources to more critical areas. In addition, an investigation is underway to merge DDSRV into SDSRV. This potentially saves operational effort, but creates a dependency between SDSRV and DDSRV.

The recovery plan schedules completion of the detailed design of these two components by May 23, at which time the DSS design document, containing the completed detailed design, will be redelivered. The full day Delta DDR will be held two weeks later on June 6. The development schedule, to be presented at the CDR "Road to AM-1" briefing will show the complete recovery of the DSS development schedule.

As noted above, the complete status report will be briefed at CDR, as the first topic of the DSS detailed design review session on Wednesday, 17 April 1996.

3.5 Draft Agenda

The draft agenda for the CDR presentation week is presented in "week-at-glance" format in Appendix B. Participants should be aware that briefings will start promptly each day. Also note that the "Breaks" in the agenda are tentative, depending on progress through the day's material.

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Appendix A. Release B Document Tree

This appendix illustrates the relationships among Release B's principal requirements and design documents.

A.1 System Requirements and Design Documents

Figure A-1, System Requirements and Design Documents, illustrates the hierarchy of the ECS project's principal system requirements and design documents. These documents apply to the ECS at the system level and, as applicable, are common across all Releases, including Release B. As applicable, documents approved by GSFC are identified by their GSFC-assigned document numbers.

A.2 Release B (CSMS/SDPS) Requirements and Design Documents

Figure A-2, Release B (CSMS/SDPS) Requirements and Design Documents, illustrates the hierarchy of the principal requirements and design documents that apply specifically to Release B (CSMS/SDPS).

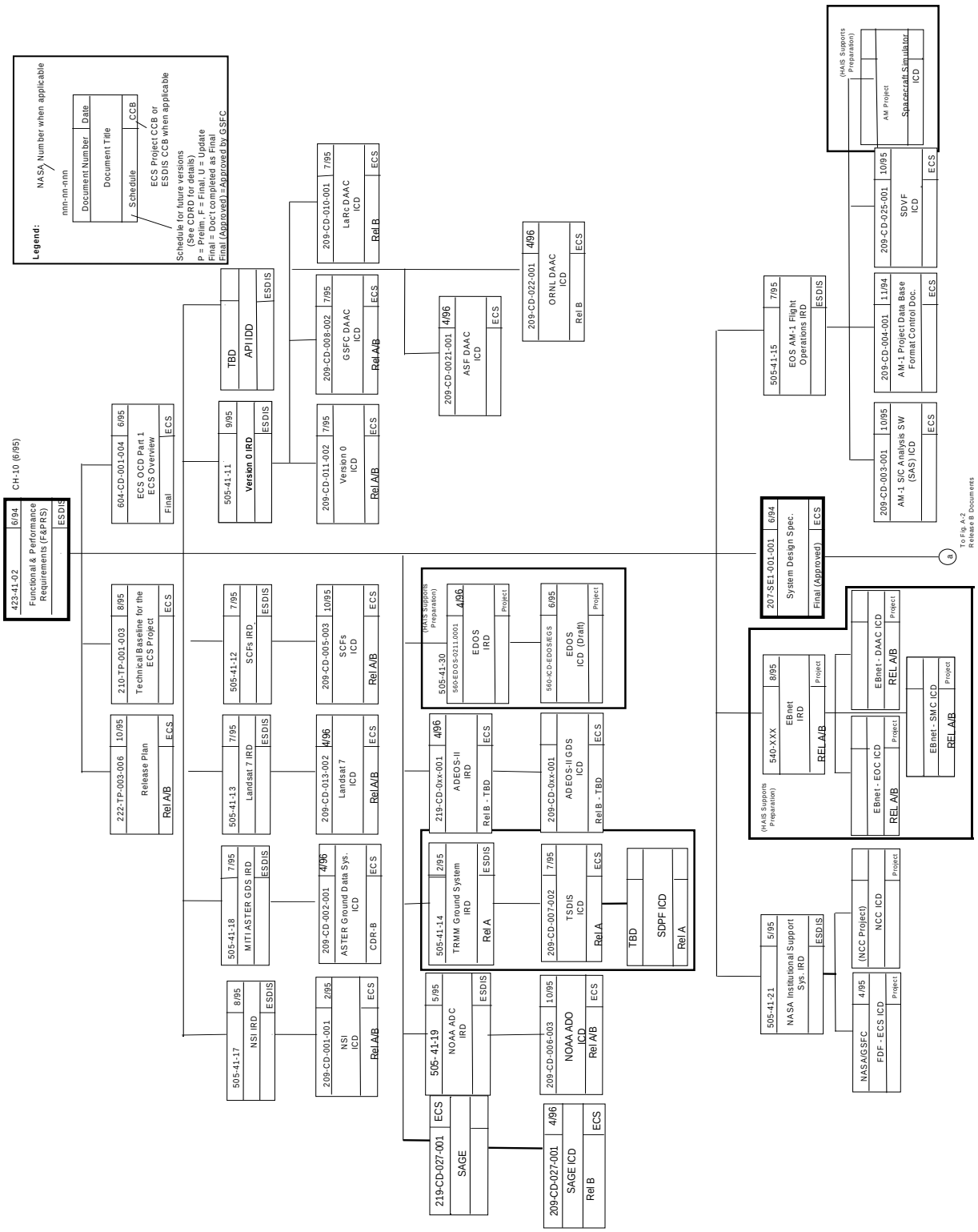

Figure A-1. System Requirements and Design Documents

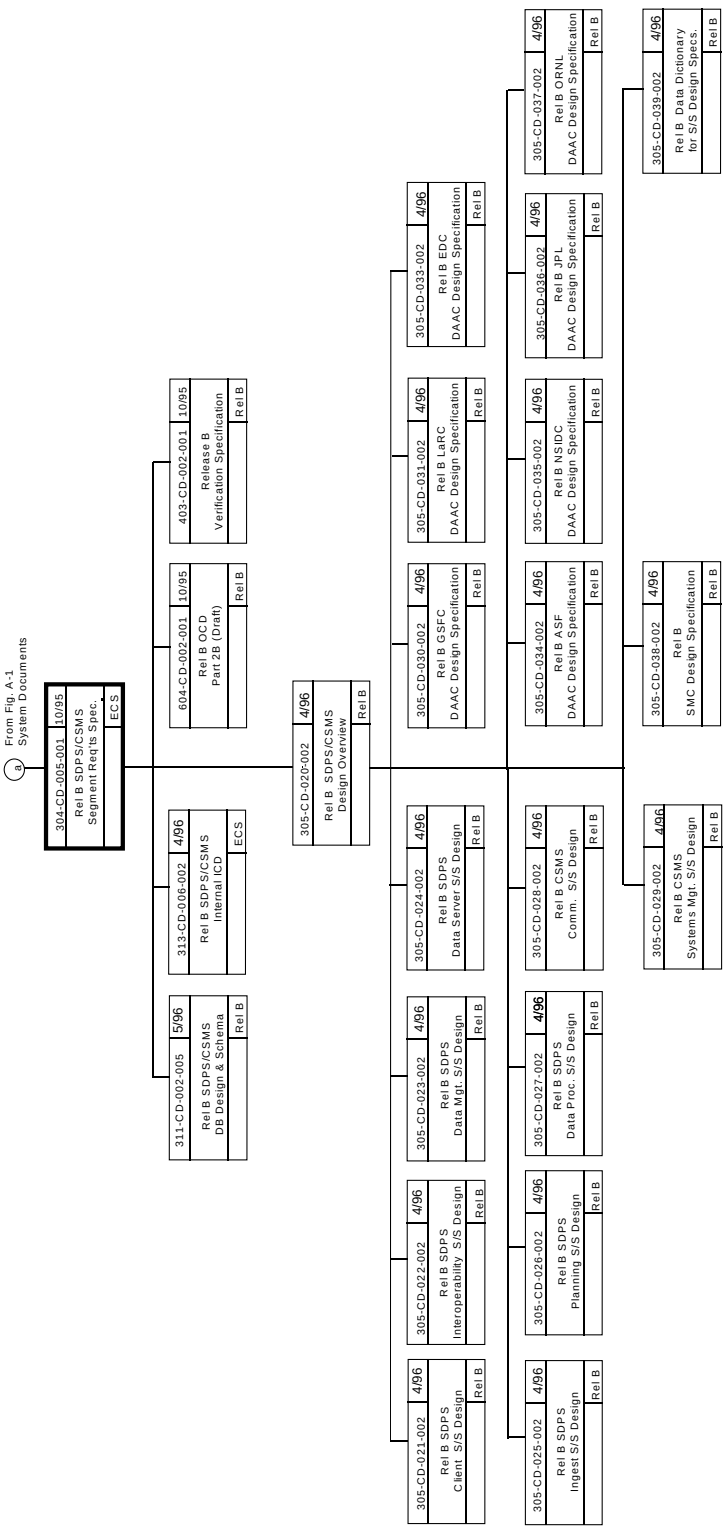

Figure A-2. Release B (CSMS/SDPS) Requirements and Design Documents

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Appendix B. Week-At-A-Glance Agenda
Detailed Design Review - Week 1

Monday	April 15, 1996
7:30 - 7:45 AM	Continental Breakfast
7;45 - 8:00 AM	Orientation, Agenda
8:00 -10:00 AM	Planning (PLS), Room 3121 Ingest (INS), Room 3130
10:00 - 10:15 AM	Break
10:15 - 12:00 PM	Planning (PLS), Room 3121 Ingest (INS), Room 3130
12:00 - 1:00 PM	Lunch
1:00 - 2:45 PM	Planning (PLS), Room 3121 Ingest (INS), Room 3130
2:45 - 3:00 PM	Break
3:00 - 5:00 PM	Planning (PLS), Room 3121 Ingest (INS), Room 3130
5:00 - 6:00 PM	Review Panel

Tuesday	April 16, 1996
7:30 - 7:45 AM	Continental Breakfast
7:45 - 8:00 AM	Orientation, Agenda
8:00 - 10:00 AM	Data Processing (DPS), Room 3121 Management SS (MSS), Room 3130
10:00 - 10:15 AM	Break
10:15 - 12:00 PM	Data Processing (DPS), Room 3121 Management SS (MSS), Room 3130
12:00 - 1:00 PM	Lunch
1:00 - 2:45 PM	Data Processing (DPS), Room 3121 Management SS (MSS), Room 3130
2:45 - 3:00 PM	Break
3:00 - 5:00 PM	Data Processing (DPS), Room 3121 Management SS (MSS), Room 3130
5:00 - 6:00 PM	Review Panel

Wednesday	April 17, 1996
7:30 - 7:45 AM	Continental Breakfast
7:45 - 8:00 AM	Orientation, Agenda
8:00 - 9:00 AM 9:00 - 10:00 AM	ECS Infrastructure, Room 3130 Communications SS (CSS), Room 3130
8:00 - 10:00 PM	Data Server (DSS), Room 3121
10:00 - 10:15 PM	Break
10:15 - 12:00 PM	Data Server (DSS), Room 3121 Communications SS (CSS), Room 3130
12:00 -1:00 PM	Lunch
1:00 - 2:45 PM	Data Server (DSS), Room 3121 Global SW Components, Room 3130
2:45 - 3:00 PM	Break
3:00 - 5:00 PM	Data Server (DSS), Room 3121 Global SW Components, Room 3130
5:00 - 6:00 PM	Review Panel

Thursday	April 18, 1996
7:30 - 7:45 AM	Continental Breakfast
7:45 - 8:00 AM	Orientation, Agenda
8:00 - 10:00 AM	Data Server SS (DSS), Room 3121 Client SS (CLS), Room 3130
10:00 - 10:15 AM	Break
10:15 - 12:00 PM	Data Server SS (DSS), Room 3121 Interoperability SS (IOS) (Adv), Room 3130
12:00 - 1:00 PM	Lunch
1:00 - 2:45 PM	Data Management (DMS), Room 3121
2:45 - 3:00 PM	Break
3:00 - 5:00 PM	Data Management (DMS), Room 3121
5:00 - 6:00 PM	Review Panel Meeting

Friday	April 19, 1996
7:30 - 7:45 AM	Continental Breakfast
7:45 - 8:00 AM	Orientation, Agenda
8:00 - 10:00 AM	HDF - EOS Room, 3121 Production Sizing, Room 3130
10:00 - 10:15 AM	Break
10:15 - 12:00 PM	Data Modeling, Room 3121 Production Sizing, Room 3130
12:00 - 1:00 PM	Lunch
1:00 - 2:45 PM	Data Assimilation Office (DAO), Room 3121

Appendix B. Week-At-A-Glance Agenda
Detailed Design Review - Week 2

Monday	April 22, 1996
7:30 - 7:45 AM	Continental Breakfast
7;45 - 8:00 AM	Orientation, Agenda
8:00 - 10:00 AM	DAAC Physical Design, Room 3121 CDR Review Panel, Room 3130
10:00 - 10:15 AM	Break
10:15 - 12:00 PM	DAAC Physical Design, Room 3121 CDR Review Panel, Room 3130
12:00 - 1:00 PM	Lunch
1:00 - 2:45 PM	DAAC Physical Design, Room 3121 CDR Review Panel, Room 3130
2:45 - 3:00 PM	Break
3:00 - 5:00 PM	ECS Operations, Room 3121 CDR Review Panel, Room 3130
5:00 - 6:00 PM	Closed Review Panel Meeting

Tuesday	April 23, 1996 Auditorium
7:30 - 800 AM	Continental Breakfast
8:00 - 8:15 AM	Introduction/Welcome (ESDIS)
8:15 - 8:30 AM	Objectives/Expectations (ECS)
8:30 - 9:00 AM	Rel B Design Drivers
9:00 - 10:00 AM	Road to CDR OPS WS, PW2, Infrastructure Review, RID Status
10:00 - 10:30 AM	Policy Decisions (ESDIS)
10:30 - 10:45 AM	Break
10:45 - 12:45 PM	System Overview EOSDIS Context ECS Overview Day in the Life of a Granule
12:45 - 1:45 PM	Lunch DEMOS
1:45 - 2:00 PM	CDR Review Board Intro
2:00 - 2:45 PM	ECS Infrastructure Review
2: 45- 3:00 PM	Break
3:00 - 3:30 PM	Communications Subsystem (CSS) Review
3:30 - 4:15 PM	Ingest Subsystem (INS) Review
4:15 - 5:00 PM	Planning Subsystem (PLS) Review
5:00 - 6:00 PM	Review Panel

Wednesday	April 24, 1996 Auditorium
7:30 - 8:00 AM	Continental Breakfast
8:00 - 8:45 AM	Data Processing Subsystem (DPS) Review
8:45 - 9:30 AM	Management Subsystem (MSS) Review
930 - 10:00 AM	Client Subsystem (CLS) Review
10:00 - 10:30 AM	Interoperability Subsystem (IOS) Review
10:30 - 10:45 AM	Break
10:45 - 11:30 AM	Data Management Subsystem (DMS) Review
11:30 - 12:30 AM	Data Server Subsystem (DSS) Review
12:30 - 1:45 PM	Lunch DEMOS POSTER SESSION
1:45 - 2:45 PM	Modeling/Sizing
2:45 -3:45 PM	External Data Provider
3:45 -4:00 PM	Break
4:00 - 5:00 PM	Transition to Release B
5:00 - 6:00 PM	Review Panel

Thursday	April 25, 1996 Auditorium
7:30 - 800 AM	Continental Breakfast
8:00 -10:00 AM	Program Management Topics
10:00 - 10:15 AM	Break
10:15 - 11:45 AM	Road to AM-1/Landsat-7
11:45 - 1:00 PM	Lunch DEMOS/Poster Sessions
1:00 - 3:00 PM	Closed Review Panel Meeting
3:00 - 5:00 PM	CDR Wrap-Up

Abbreviations and Acronyms

ACRIM	Active Cavity Radiometer Irradiance Monitor
ADEOS	Advanced Earth Observing Satellite (Japan)
ALT	Altimeter
AM	Morning (ante meridian)
AMSR	Advanced Microwave Scanning Radiometer
ASF	Alaska SAR Facility
CDR	Critical design review
CDRD	Contract Data Requirements Document
CERES	Clouds and Earth's Radiant Energy System
CLS	Client Subsystem
CSA	Canadian Space Agency
CSMS	Communications and System Management Segment
CSS	Communications Subsystem
DAAC	Distributed Active Archive Center
DAS	data assimilation system
DCE	Distributed Computing Environment
DDICT	Data Dictionary Services CSCI
DFA	Dual Frequency Altimeter
DIT	Design Integration Team
DME	distributed management environment
DMS	Data Management Subsystem
DPS	Data Processing Subsystem
DSS	Data Server Subsystem
EBnet	EOSDIS Backbone Network
ECS	EOSDIS Core System
EDC	EROS Data Center
EDHS	ECS Data Handling System
EDOS	EOS Data and Operations System

EOC	EOS Operations Center
EOS	Earth Observing System
EOSDIS	EOS Data and Information System
ERS	Earth Resources Satellite
ESDIS	Earth Science Data and Information System (Project)
ESN	EOSDIS Science Network
FOS	Flight Operations Segment (ECS)
GCDIS	Global Change Data and Information System
GDS	ground data system
GPCC	Global Precipitation Climatology Center
GPCP	Global Precipitation Climatology Project
GSFC	Goddard Space Flight Center
GV	ground validation data (TRMM)
HDF	Hierarchical data format
IATO	Independent Acceptance Test Organization
IAS	Imagery Assessment System
ICD	Interface Control Drawing
IDR	Incremental Design Review
INS	Ingest Subsystem
IOS	Interoperability Subsystem
IRD	Interface Requirement Document
ISCCP	International Satellite Cloud Climatology Project
IV&V	independent verification and validation
JERS	Japanese Earth Remote-Sensing Satellite
JPL	Jet Propulsion Laboratory
LAN	Local Area Network
LaRC	Langley Research Center
LIM	Local Information Manager
LIS	Lightning Imaging Sensor
LPS	Landsat Processing System
M&O	Maintenance and Operations

MISR	Multi-Angle Imaging SpectroRadiometer
MODIS	Moderate Resolution Imaging Spectrometer
MOPITT	Measurements of Pollution in the Troposphere
MR	Microwave Radiometer
MSFC	Marshall Space Flight Center
MSS	Management Subsystem
Nascom	NASA Communications Network
NOAA	National Oceanic and Atmospheric Administration
NOLAN	Nascomm Operational Local Area Network
NSI	NASA Science Internet
NSIDC	National Snow and Ice Data Center
ORNL	Oak Ridge National Laboratory
PDPS	Planning and Data Processing Subsystem
PDR	Preliminary Design Review
PLS	Planning Subsystem
PSCN	Program Support Communications Network
QA	Quality Assurance
SAGE	Stratospheric Aerosol and Gas Experiment
SAR	Synthetic Aperture Radar
SAS	Spacecraft Analysis Software
SCDO	Science and Communications Development Office
SCF	Science Computing Facility
SDP	Science Data Plan
SDPF	Science Data Processing Facility
SDPS	Science Data Processing Segment
SEDAC	Socio-Economic Data and Application Center
SMC	System Monitoring and Coordination Facility
SMO	System Management Office
SSM	Special Sensor Microwave/Imager
TMI	TRMM Microwave Imager
TP	Technical Paper

TRMM	Tropical Rainfall Measuring Mission (joint US-Japan)
TSDIS	TRMM Science Data and Information System
URL	Uniform Resource Locator
V0	Version 0
VIRS	Visible Infrared Scanner
WAN	Wide Area Network